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SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
07/337,566	04/13/89	HARARI	

EXAMINER: ELMORE, R

ART UNIT: 2312 | PAPER NUMBER: 11

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DATE MAILED: 08/14/92

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

8/14/92

☒ This application has been examined ☒ Responsive to communication filed on 5-4-92 ☒ This action is made final.

A shortened statutory period for response to this action is set to expire 3 (THREE) month(s), 0 days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☐ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice re Patent Drawing, PTO-948.
3. ☐ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, Form PTO-152
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____.

Part II SUMMARY OF ACTION

1. ☒ Claims 30-33, 35-39, 41-47, 49-53, 55 & 63-67 are pending in the application.

   Of the above, claims _____ are withdrawn from consideration.

2. ☒ Claims 1-29, 34, 40, 48, 54 and 56-62. have been cancelled.

3. ☐ Claims _____ are allowed.

4. ☒ Claims 30-33, 35-39, 41-47, 49-53, 55 & 63-67 are rejected.

5. ☐ Claims _____ are objected to.

6. ☐ Claims _____ are subject to restriction or election requirement.

7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice re Patent Drawing, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____. has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).

12. ☐ Acknowledgement is made of the claim for priority under U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.

13. ☐ Since this application apppears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

EXAMINER'S ACTION

PTOL-326 (Rev.9-89)

1. Claims 30-33, 35-39, 41-47, 49-53, 55 and 63-67 are presented for examination.

2. Claims 1-29, 34, 40, 48, 54 and 56-62 have be cancelled by the amendment filed 5-4-92.

3. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed 5-4-92 have been received, however the changes to the drawing have not be shown in red.

4. The previous objections to the drawings are withdrawn due to the amendment.

5. The rejections under 35 USC 112, second paragraph are withdrawn due to the amendment.

6. The rejection of claims 30-33 , 35-39, 41-47, 49-53 and 55 as being unpatentable over Furuya et al. in view of Terada et al. is maintained. The rejection is repeated below with the new claims 63-67 added to the rejection.

7. The following is a quotation of 35 USC § 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this

section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

9. Claims 30-33, 35-39, 41-47, 49-53, 55 and 63-67 are rejected under 35 USC § 103 as being unpatentable over Furuya et al. in view of Terada et al.

Furuya teaches the invention (claims 30, 36, 42, 46 and 50) substantially as claimed including a memory system comprising:

(a) cache memory for temporarily storing data files intended for non-volatile storage (e.g., see col. 5, lines 7-9);

(b) means to write data files to the cache instead of the non-volatile storage (e.g., see col. 8, lines 23-31);

(c) means of identifying each data file in the cache memory is taught as a cache directory (e.g., see col. 5, lines 22-28);

(d) means for moving data files from the cache memory to the non-volatile storage according to a least recently used replacement algorithm (e.g., see col. 2, lines 23-32); and

(e) means for writing directly to the non-volatile storage when a write miss occurs in the cache (e.g., see col. 8, lines 56-59).

Furuya does not teach the non-volatile storage as an EEPROM memory, however, Terada teaches using EEPROMs as non-volatile memory storage. It would have been obvious to one of ordinary skill in the art of memory storage at the time the invention was made to use EEPROMs as the non-volatile memory of Furuya because

the EEPROM memory system of Terada allows the added protection and security for data stored in non-volatile memory as well as improved access time thereby improving the overall performance of a system using non-volatile memory.

As to claims 31, 37, 43 and 51, Furuya teaches the non-volatile memory being used as back-up memory for the cache and as being responsive to impending power loss to save data files which would be lost in volatile memory (e.g., see col. 2, lines 53 et seq.).

As to claims 32, 38, 44 and 52, Terada teaches the backup memory can be a flash EEPROM memory system (e.g., see col. 2, lines 60-62). It would have been obvious to one of ordinary skill in the art of memory storage at the time the invention was made to use EEPROMs as the non-volatile memory of Furuya because the EEPROM memory system of Terada allows the added protection and security for data stored in non-volatile memory as well as improved access time thereby improving the overall performance of a system using non-volatile memory.

As to claims 33, 39, 47 and 53, Furuya teaches the cache memory is faster than the non-volatile memory (e.g., see col. 1, lines 27-32).

As to claims 35, 41, 49 and 55, Furuya teaches the cache is part of a random access memory system (e.g., see col. 1, lines 13-21).

As to method claims 63-67, they do not teach or define above the corresponding apparatus claims and are therefore rejected for the same reasons.

7. As to the applicant's remarks concerning the field of use of the present invention, changing the usage of an invention does not present a patentable distinction over the prior art. Claiming the limitation of writing and erasing to the EEPROM is for stress reduction and prolonging the life of the memory chip does not change the structure of the invention. Also, it is well recognized in the art of memory storage that memory devices have a limited time span of reliability and will degrade in performance after prolonged use.

8. Applicant's arguments filed 5-4-92 have been fully considered but they are not deemed to be persuasive.

9. Applicant's amendment necessitated the new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL.** See M.P.E.P. § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

> (a)) A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bastian et al. teaches a method and apparatus for limiting data occupancy in a cache.

Beardsley et al. teaches fast write operations to non-volatile memory.

Berger st al. teaches maintaining duplex-paired storage devices during gap processing using a dual copy function.

Fukuda et al. teaches using EEPROMs for random access memory.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Reba. I. Elmore whose telephone number is (703) 308-1619.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0754.

Reba I. Elmore

August 13, 1992

JOSEPH L. DIXON
PRIMARY EXAMINER
GROUP 230